

# **IHS Best Practice Model**

## **Dental Complications Of Diabetes**

The following Dental information is intended as a component of the overall prevention, treatment and care of individuals with diabetes in American Indian and Alaskan Native populations. Addressing the dental complications of diabetic patients is not only important for the prevention of oral infections and tooth loss, but also contributes to the overall improvement of glycemic control for these people.

### **Dental Complications Of Diabetes Care**

#### **Background**

Periodontal (gum) disease is one of the six complications of diabetes (1). Periodontal disease is an infection of the supporting tissues of the teeth caused by specific bacteria. Among American Indians/Alaskan Natives (AI/AN) with diabetes, advanced periodontal disease occurs at rates two to three times higher than for individuals who do not have diabetes (2). Infections, associated with advanced periodontal disease, can interfere with an individual's blood sugar control and can actually cause blood sugar levels to rise. Additionally, periodontal disease results in the loss of all teeth in approximately one third of AI/AN people with diabetes. People with no teeth can suffer not only emotionally from the social embarrassment of an unacceptable appearance, but nutritionally, due to an inadequate ability to eat many types of important foods.

#### **Best Practice Models**

##### **Periodontal Disease Treatment**

Historically, traditional American dental treatment and practices have never addressed the unique needs of diabetic patients. Little, if any, information regarding treating and caring for the oral health needs of people with diabetes has been written in professional journals and/or taught at American dental schools. Addressing the dental needs of diabetic patients in a public health setting has received even less attention by dental health professionals. However, knowing that little information existed in the way of caring for the dental needs of diabetics, the Indian Health Service (IHS) entered into a clinical research venture with the National Institute for Dental and Cranial Research (NIDCR) and the State University of New York at Buffalo (SUNY-Buffalo) in the early 1990s to develop new and successful treatments specifically for diabetic people who also have periodontal disease. Clinical trials were and are being conducted at multiple sites in the IHS to continue to refine and improve the dental treatment needs of diabetic patients. As a result of these research efforts, several scientific papers have been written which describe very successful treatment protocols for treating periodontal disease in diabetics (3). The findings from these studies have shown that following dental treatment, the blood sugar control of patients has consistently improved as a result of eliminating the oral infections associated with periodontal

disease (4). The findings from the IHS/NIDCR/SUNY-Buffalo research has been formalized into a treatment protocol called, Periodontal Disease Treatment Protocol for Individuals with Type 2 Diabetes Mellitus. **(A description this treatment protocol can be found in the Indian Health Service Oral Health Program Guide, in the HP/DP section.)** This treatment protocol is the only known scientifically proven public health approach to the successful treatment of periodontal disease in diabetic patients. The protocol has been widely advertised throughout the IHS and other public health organizations. However, the implementation of the protocol generally requires additional staff or staff time and training. A copy of the diabetes/periodontal disease treatment protocol can be found in Appendix 1.

## **Dental Prosthetic Treatment**

Once periodontal disease treatment needs of diabetic patients have been implemented, other specific dental diabetic needs can be contemplated. As described above, approximately 30% of diabetic patients have few if any remaining natural teeth. Usually, the prosthetic needs of these edentulous individuals are not addressed. Dental prosthetic services are costly and require additional treatment time when compared to routine dental services, i.e. fillings, cleaning procedures, etc. For this reason, scarce dental resources are frequently not used for these more complicated prosthetic services. The result is that diabetic patients, who have no teeth, go without having dentures provided to them. For this reason, targeted funding is needed to address this special needs population of diabetic patients. Fortunately, a very cost-effective, “public health denture technique” has been developed which can reduce both the time involved and cost associated with denture construction. This technique has been used in several AI/AN communities to address the common unmet needs of diabetic patients. This experience has helped to determine estimated costs for implementing a denture program for diabetic patients. The costs estimates can be found in the next section.

## **Target Populations And Program Readiness**

The identification of current and future diabetic patients (target population) is essential to planning the implementation of a periodontal disease prevention and treatment program, as well as estimating dental prosthetic needs. Determining the number of diabetic patients and their dental status is the first step in identifying and organizing the dental resources needed to address the oral health needs of these individuals. Most IHS direct and many tribal programs can utilize the RPMS data system to search for a specific population’s already diagnosed diabetic patients. If RPMS or some similar type of locally supported patient data system is not available, some other method of counting the number of diagnosed diabetic patients for your population must be undertaken to identify this target population.

Once the diabetic patients have been identified, dental records or dental screening examinations can determine the basic oral health status, e.g. number of teeth missing, periodontal status of teeth present, etc. The findings from this patient status review can provide the necessary information needed to calculate the dental resources required to meet the needs of the diabetic target group.

Dental managers should be able to determine the right combination of dentists, hygienist dental assistants and possible dental contractors needed for the periodontal disease treatment program and denture services. The number of diabetic patients and their oral health status should help to determine the magnitude of the dental effort and human resources required. In addition, there must be adequate dental space and equipment available, i.e. operatories, dental chairs and instruments, in the clinic to physically support the diabetes program. Some health programs, with only a few diabetic patients, may require only a part-time dental staff to accomplish the task, while other large programs, with many hundreds or thousands of diabetic patients, may require many extra full-time dental staff members. The availability of existing staff or the potential for adding additional staff will help to determine the readiness of the dental clinic to undertake a diabetes periodontal disease treatment program.

An example of the minimum resources required by a dental clinic whose diabetic population is large enough to demand a full time dental staff would look like the following:

**Periodontal Disease Treatment Protocol: (Estimate)**

<u>Staffing:</u>	<u>Positions</u>	<u>Annual Salary</u>
	Dental Hygienist (1) Commissioned Officer 02+2 years	\$35,000
	Dental Assistant (2) Expanded function GS-5 @ \$28,750/year	\$57,500
	<b><u>Staffing Total:</u></b>	<b><u>\$92,500</u></b>
<b><u>Supplies:</u></b>	Annual equipment and supply costs	<u>\$ 7,500</u>
	<b>Approximate Annual Total Funding</b>	<b>\$100,000</b>

The above is just a typical example of a full time clinic staff. However, a variety of different combinations of part and full-time staff could make up for the same clinical workload. Further, if the diabetic population is smaller or larger than what is required for a minimum, full-time staff, the budget could be adjusted up or down to meet the work requirements.

**Public Health Denture Technique: (Estimate – based on 40 full/full denture patients)**

<u>Staffing:</u>	<u>Positions</u>	<u>Costs</u>
	Technique Trained Contract Dentist	\$ 9,600
	Laboratory Fees	<u>\$ 6,800</u>
	<b>Total</b>	<b><u>\$16,800</u></b>
	* Average cost/patient	\$ 410

\*Based on 4 patient treatment visits + one Follow-up visit

Existing dental staff can also provide traditional denture services if staff time is available. However, generally traditional denture construction procedures require more time than that proposed in the public health denture technique. A final, and most costly option, may be to contract the total cost of denture construction to a private practice dentist in nearby communities. The average cost for full/full denture services, for one patient, in the private sector, can range from \$1500-2000 or higher. For some dental health facilities, utilizing the private sector may be the only option available.

### **Data Collection Requirements**

Certain services and clinical data are desirable for periodontal disease programs. The data collected and reported can be used to measure program progress and compliance. In addition, successes or difficulties with program efforts can be documented with data collections. This experiential data can then be used to assist other programs engaged in similar activities. As a minimum, the following data collection items are suggested for program success:

### **Semi-Annual Report**

#### **Site Statistics**

Number of registered patients (RPMS or local database)	_____
Number of diagnosed diabetic patients (total)	_____
Number of newly diagnosed diabetic patients (current FY)	_____

#### **Treatment Statistics**

Number of DM patients provided a dental exam (current FY)	_____
Number of DM patients provided initial perio Tx (current FY)	_____
Partial Tx	_____
Complete Tx	_____
Number of DM patients seen at first recall (current FY)	_____
Number of DM patients on recall registry (total all FYs)	_____
Broken appointment rate for DM recall patients (current FY)	_____

#### **Clinical Statistics**

Number of DM patients improved following initial Tx *	_____
Number of DM patients unimproved following initial Tx**	_____
Number of DM patients clinically stable on recall <sup>†</sup>	_____
Number of DM patients clinically declining on recall <sup>††</sup>	_____
Average HbA1c values for clinically stable recall patients	_____

Average HbA1c values for clinically declining recall patients \_\_\_\_\_

### **Denture Statistics**

Number of DM patients with edentulous maxilla \_\_\_\_\_  
Number of DM patients with edentulous mandible \_\_\_\_\_  
Number of DM patients with total edentulous arches \_\_\_\_\_  
Number of single (full upper or full lower) dentures made \_\_\_\_\_  
Number of full mouth dentures made (full/full) \_\_\_\_\_

\*  $\geq 5$  sites with pocket depth reductions  $\geq 2$  mm (full mouth probing), 1-2 months after initial Tx  
\*\*  $< 5$  sites with pocket depth reductions  $\geq 2$  mm (full mouth probing), 1-2 months after initial Tx  
† No significant pocket depth changes since previous full mouth probing  
††  $\geq 5$  sites with pocket depth increases  $\geq 2$  mm since previous full mouth probing

### **References**

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4. Periodontal Disease in Non-Insulin-Dependent Diabetes Mellitus. Emrich, LJ, Shlossman, M, Genco, RJ. J Periodontol 1991;62:123-130.

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